

On July 20 last I found a female of this species attacking a pupa of *Melasoma interruptum* Hald. on alder at North East, Pa. These pupae were very abundant, attached by the caudal end to the upper surface of the leaves. I captured the parasite and placed it with pupae of the beetle in a vial. It very shortly showed interest in the pupae and began its attack upon them. In ovipositing it inserted the tip of the abdomen between the pupal legs and wings. The exposed pupae were not again examined until five days later when all nine were found to be parasitized. Some of the parasites were in the larval and some in the pupal stage, some of the latter being already black. It is evident that some at least, and probably all, of the host pupae had already been parasitized when placed in the vial. But two, one bearing larvae and one pupae, had been parasitized for the second time and the minute larvae were feeding on the older parasites. These younger larvae were probably the offspring of the adult captured. Both larvae and pupae of the parasites were on the venter of the host and protected by the wing pads and legs. There were from 3 to 7 parasites per host. Usually one larva was attached to each of the wing pads and the rest to the venter of the host. (See Plate XIV.) When the larvae had finished feeding, the host pupa was sucked dry, but retained nearly its natural form. The pupae of the parasite were attached by their caudal end to the under side of the host remains.

An attempt was made to get the female parasite originally captured to attack pupae of *Melasoma tremulae*, but she paid no attention whatever to them. There seems to be no reason why the species should not attack *tremulae* since according to Ratzeburg, mentioned above, it was first reared from the closely allied *M. populi*. Its failure in this case to attack *tremulae* may have been due to age as the parasite died two days after the introduction of the *tremulae* pupae.

On the 30th day of July the parasitism was so great that among fifty or more pupae of the host species examined, I found only three unparasitized.

EXPLANATION OF PLATE XIV.

Schizonotus sieboldi Ratz. Larvae and pupae in situ beneath pupae of the host, *Melasoma interruptum* Hald.

TWO NEW HYDROPHILID BEETLES.

By E. A. SCHWARZ AND H. S. BARBER.

A species of the Hydrophilid genus *Epimctopus* Lac. 1854 (*Ceratoderus* Muls. 1851 non Westw. 1841; *Sepidulum* Lec. 1874) found in Arizona has been mentioned by the senior writer in his

introductory remarks to Dr. Boying's paper on *Hydroscapha* and requires characterization in order to enable us to distribute duplicate specimen to the workers in Hydrophilidae. Since Dr. Sharp 1874 has pointed out the close affinity of *Epimetopus* with *Spercheus* we take this opportunity to append a description of an apparently new species of the latter genus from the Philippines.

***Epimetopus thermarum* n. sp.**

Similar to *E. costatum* Lec. but larger, piceous, except the legs and apical half of elytra which are rufescent, more coarsely tuberculate and with the eye completely divided by the canthus. Length 2.2 to 2.8 mm. width 1.2 to 1.6 mm.

Habitat: Arizona.

Front coarsely tuberculate, opaque; labrum smooth, shining, feebly emarginate; canthus apparently completely dividing the eye, its upper and lower edges tuberculate and separated by shallow sulcus. Antennae 9-jointed, with loosely connected 3-jointed club; scape as long as the rest of the antennae, bent inward and thickened apically; second joint subglobular and nearly as wide as apex of the scape; third to sixth inclusive hardly half as wide as, and together not longer than the second, first joint of club about same size as second joint of antenna, second twice as wide but not longer, last joint a little wider and three times as long as first. Last joint of maxillary palpi as long as club of antennae. Pronotum slightly wider than long, sides strongly angulate at middle, front margin produced over head, surface coarsely tuberculate with a pair of longitudinal costae uniting at basal fifth and apical tenth inclosing a lance-shaped median impression, and an outer pair of sinuate costae at lateral fourth. Elytra each with sutural, marginal, and four intermediate carinae, the second of the latter being interrupted at basal fourth, the third joining the humerus and the fourth obsolete except a trace behind middle and a prominent elongate tubercle at basal third. Inter-costal areas each with two series of large round almost perforate punctures, and three series of tubercles. Tarsi 5-jointed, tibiae octagonal, the carinae with setigerous serrations.

Sexes similar in all external characters.

Type and paratypes:—U. S. N. M. No. 21,052.

Described from a large series (90 specimens) collected by the writers June 24–26, 1901, in the algal accumulations at the margins of the warm stream (about 100° F.) flowing from the Castle Creek Hot Springs, Yavapai Co., Arizona. A single specimen was also taken at the same place by the writers, December 27, 1913, being the only one observed during a diligent search at that season.

At the time of our first discovery of this species the hot stream

was nearly in its original state so that the margins were lined with a considerable accumulation of dead reeds matted together with a very wet algal growth, among which this beetle, with occasional specimens of *Hydroscapha*, was slowly crawling about. Larvae, apparently of *Epimetopus*, were also collected but were lost in the fire a few days later at Williams, Arizona, which unfortunately destroyed the bulk of our alcoholic material from the Hot Springs. The specimens now before us were all preserved dry and in the washing and remounting operations, most of the females have lost their egg-sacks (cf. Sharp, 1874, p. 248) so that we have almost no biological material and this (the egg-sack) is to be described in a work on Hydrophilid biologies by Mr. E. A. Richmond.

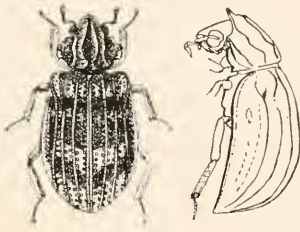


FIG. 1.



FIG. 2.

In regard to the mode of life of our only previously known species of this genus which as far as we know comes from a single locality, viz., Bosc Co., Texas. The senior writer remembers having seen a letter from Theo. Belfrage to Dr. John L. LeConte in which he states that the species occurs not infrequently at the swampy margin of rivers, in company with the usual riparian coleopterous fauna such as *Tachys*, *Tachyusa*, *Stenus*, *Bledius*, *Heterocerus*, etc. We know of no specimens except those collected by Belfrage, but Dr. Sharp 1882 records it from two localities in Guatemala.

Of the seven species now comprising the genus four are American and three are Asiatic, but only the two United States species have been seen by us; four of the other five species appear to be described from unique examples. In contrasting their descriptions the following table of species was drawn up, the most salient differences being taken from the characters there stated, and their comparative value in this table may not be trustworthy. The three Asiatic species appear to be not congeneric with the American forms, apparently having a different type of pronotal lobe and more pronounced elytral tubercles with metallic luster.

TABLE OF SPECIES OF *Epimetopus*:

- a. Eyes completely divided by the canthus
 b. Color piceous, legs and apical half of elytra rufescent 2.2-2.8 mm.
 (Arizona).....*thermarum* S. & B.
 bb. Color ashly red, 3 mm. (South America or possibly Mexico)
trogoides Sharp 1874.
- aa. Eyes only about half divided by the canthus
 c. Tubercles not metallic, pronotal lobe simple (America)
 d. Color fuscus, elytra paler behind, legs ferruginous 2.3 mm. (Columbia).....*graniger* Muls. 1851.
 dd. Color entirely reddish brown, tubercles small and rounded 2 mm.
 (Texas).....*costatus* Lec. 1874.
- cc. Tubercles metallic, pronotal lobe with apical elevated area (Asiatic)
 e. Black with green and purplish metallic reflections; head, pronotum and elytra strongly tuberculate; pronotal lobe emarginate anteriorly with unibilicate rounded tubercle 2.5-3.0 mm. (southern India).....*maindroni* Reg. 1903.
 ee. Blackish, posteriorly reddish, small apical elevated area on pronotal lobe appearing like another lobe, clypeus metallic $3\frac{2}{3}$ mm. (India).....*bullatus* Sharp 1874.
 eee. Sordid yellow, head and breast black, pronotum fuscous; pronotal lobe with peculiar median marginate elevation near apex 3 mm. (Ceylon).....*flavidulus* Sharp 1890.

The literature on *Epimetopus*, as far as known to us, is as follows:

1851. Mulsant (Mém. de l'Acad. d. Sciences de Lyon, I, p. 1) describes *Ceratoderus* n. gen. for *C. graniger* n. sp. from the United States of Columbia.
1854. Lacordaire (Genera des Col., vol. I, p. 467), having seen no specimens of the genus, reproduces Mulsant's description but, being aware of the fact that the name *Ceratoderus* is preoccupied by Westwood, changes it to *Epimetopus*.
1874. Leconte (Trans. Amer. Ent. Soc., vol. 5, p. 47) erects the genus *Sepidulum* an anomalous member of the Hydrophilidae approaching the genus *Ochthebius*, for *costatum* n. sp. from Texas, collected by Belfrage.
1874. Sharp (Entom. Mo. Mag., vol. 11, pp. 247-250) discusses the characters of Leconte's genus *Sepidulum*, finding that the tarsi are 5-jointed and refers to the structure of the abdomen. He places the genus near *Spercheus* and describes *Sepidulum trogoides* n. sp. from "South America or possibly Mexico" and *Sepidulum bullatum* from India.
1882. Sharp (Biol. Centr.-Amer. Coleopt., vol. 1, pt. 2, p. 88, pl. 3, fig. 3) places *Sepidulum* as a synonym of Lacordaire's genus *Epi-*

- metopus*, figures the Texan *E. costatum* and records its occurrence at two localities in Guatemala. He remarks "the species of this genus are probably riparial rather than aquatic in their habits."
1883. LeConte & Horn (Class. Col. N. A., p. 71) recognize the synonymy of *Sepidulum* with *Epimetopus* and place the genus among the Helophorinae.
1890. Sharp (Trans. Ent. Soc., London, p. 355) describes *Epimetopus flavidulus* from Kandy, Ceylon (one specimen).
1903. Regimbart (Ann. Soc. Ent. Fr. LXXII, p. 338) describes *Epimetopus maindroni* n. sp. from the moat of the fortress of Gengi, *southern India.
1908. Schwarz (Proc. Ent. Soc. Wash., vol. 9, p. 115) alludes to structures of the *Epimetopus* from Arizona.
1914. Schwarz (Proc. Ent. Soc. Wash., vol. 16, p. 165) lists *Epimetopus* nov. spec. among the species occurring in the middle course of the warm stream.
1916. d'Orchymont (Ann. Soc. Ent. Fr., vol. 85, pp. 101 and 105) proposes eight subfamilies of Palpicornia, the third and fifth being respectively the Spercheinae and Epimetopinae, the latter being suggested provisionally on adult characters since its larval stages are unknown.

Spercheus stangli n. sp.

Shining, coarsely punctate with sparse short erect squamae, piceous, the elytra variegated with fine irregular pale markings and each with three tubercles in addition to the humeral umbone. Length $3\frac{1}{2}$ mm.

Habitat: Philippine Islands.

Head with sparse squamiferous punctures, margin deflexed at middle and straight for one-third width of head, thence elevated into a marginal flange which extends obliquely backward and encroaches slightly onto the eye. Pronotum two and one-fourth times as wide as long, widest at apical third, front angles a little produced anteriorly, side margins arcuate to middle, thence straight to hind angles which are obtuse; base feebly sinuate close to hind angles and at lateral third; surface smooth, impunctate and highly polished basally, becoming coarsely punctate in the lateral depressions and on the pair of transverse anterior median callosities which are separated by a median impressed line obsolete in median third. Elytra about four-fifths as wide as long, widest at basal third, with side margins strongly expanded laterally, evenly rounded in basal half, thence straight and convergent to near apices which are strongly and not conjointly rounded; surface coarsely, closely, subseriately punctate, with a very pronounced pair of gibbosities near suture at apical fifth, another nearly as pronounced just behind middle and about halfway between suture and margin, and a less conspicuous pair at basal sixth and half way between the suture and the very prominent humeral gibbosity. Tibiae 6-carinate.

Type and paratype U. S. N. M. No. 21,053.

Described from two specimens received in 1901 from P. L. Stangl which are labelled Bay, Laguna Province, Philippine Islands. In the type the humeral umbone is produced posteriorly into a carina for a third the length of the elytra and the outline of the head is slightly different but these are believed to be variational or sexual differences. When received both examples were covered with a thin opaque grayish encrustation which entirely obscured the surface sculpture, exposing only a few of the club-shaped setae on the margins and on the tubercles. With the aid of a fine needle it was possible to scale off this encrustation from one side of one specimen; the setae being fast in the encrustation were naturally removed with it.

Fourteen species are now recognized in the genus only two of which are before us. From the literature at hand the twenty-two specific names proposed in this genus may be listed as follows:

LIST OF SPECIES OF *Spercheus*.

<i>algoensis</i> Peringuey 1892.....	South Africa
<i>australis</i> Peringuey 1892.....	South Africa
<i>capicola</i> Peringuey 1892.....	South Africa
<i>cerisyi</i> Guérin Ménévillè 1835.....	Egypt
<i>cerysii</i> Lacordaire 1854	
(<i>costatus</i> Castelnau 1840) = <i>senegalensis</i>	
<i>crenulatus</i> Fairmaire 1893, Kolbe 1897.....	East Africa
<i>crenaticollis</i> Regimbart 1906.....	East Africa
<i>distingucundus</i> Fairmaire 1893 and 1903) = <i>senegalensis</i>	
<i>emarginatus</i> Auctorum.....	Europe
<i>luridus</i> Mathieu 1858	
<i>sordidus</i> Marsham 1802	
<i>verrucosus</i> Marsham 1802	
<i>hovanus</i> Fairmaire 1903.....	Madagascar
<i>humeralis</i> Regimbart 1906.....	East Africa
<i>interruptus</i> Fairmaire 1892.....	East Africa
(<i>luridus</i> Mathieu 1858) = <i>emarginatus</i>	
<i>mulstanti</i> Perroud 1864.....	New Caledonia
<i>priscus</i> Sharp 1875, Fauvel 1883.....	Queensland
<i>platycephalus</i> MacLeay 1825, Castelnau 1840, Lacordaire 1854.....	Java
(<i>priscus</i> Sharp 1875) = <i>mulstanti</i>	
<i>senegalensis</i> Laporte 1832, Guérin-Ménévillè 1835, Castelnau 1840, Lacordaire 1854, Fairmaire 1893, 1903.....	{ Senegal Dahomey Angola Madagascar Zanzibar
<i>sulcatus</i> Gory in Guérin-Ménévillè 1835.	
<i>costatus</i> Castelnau 1840.	